**Precalculus Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Notes 2.1**

1. **Quadratic Functions**

* A Quadratic Function is a function that can be written in the standard form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where a ≠ 0.
* It can also be written as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* “ax2” is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* “bx” is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* “c” is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The graph of a quadratic function is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* A quadratic equation can have \_\_, \_\_, or \_\_\_ solutions.
* The solutions can also be called \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Standard form of a quadratic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Vertex form of a quadratic: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**The vertex is ( , ).**

1. **Graphing on the Calculator**

**Enter the following parabolas into the graphing calculator:**

1. f(x) = x2 2. f(x) – 5 = x2

3. f(x) + 4 = x2 4. f(x) = 4x2

5. f(x) = x2 6. f(x) = - 6x2

7. f(x) = (x + 3)2 8. f(x) = (x – 5)2

1. **Without graphing the following, predict how the graph will look when compared to the “normal” graph of y = x2. Name the vertex, directions of opening, and describe the width.**

1. y – 2 = 3x2 2. y + 4 = x2 3. y = (x + 6)2

4. y = -2(x – 1)2 5. y + 8 = (x - 3)2 6. y – 5 = (x + 7)2

**\*If…**

* **|a| = 1** the width of the parabola is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* **|a| > 1** the parabola has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* **|a| < 1** the parabola has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. **Write the following equations in vertex form using the method.**

**h = k = plug in for x**

1. y = x2 – 6x + 21 2. y = -2x2 – 16x – 32

a = \_\_\_ b = \_\_\_ a = \_\_\_ b = \_\_\_

3. y = x2 – 4x + 9 4. y = 4x2 + 6x + 3

a = \_\_\_ b = \_\_\_ a = \_\_\_ b = \_\_\_

1. **Application**
2. An object is launched directly upward at 64 ft. /s from a platform 80 ft. high. The object follows that path given by: *h(t)* = -16*t*2 + 64*t* + 80. Where *h(t)*  is the height of the ball after *t* seconds. What will be the object's maximum height? How much time will have passed before it reaches hits the ground?